

CLAIMS

WHAT IS CLAIMED IS:

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1. A wireless communications device, comprising:

a first antenna;

a second antenna;

10 a switching module coupled to the first antenna and to the second antenna;

a receiver module coupled to the first antenna and to the second antenna via the switching module; and

15 a transmitter module coupled to the first antenna and to the second antenna via the switching module,

wherein the switching module is adapted to couple the receiver module to one of the first antenna or the second antenna as a function of a reception characteristic of the first antenna and the second antenna, and

20 wherein the switching module is adapted to couple the transmitter module to one of the first antenna or the second antenna as a function of a transmission characteristic of the first antenna and the second antenna.

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2. The wireless communications device according to claim 1,

wherein the switching module includes a first switch and a second switch,

wherein the receiving module is coupled to the first antenna and to the second antenna via the first switch, and

wherein the transmitter module is coupled to the first antenna and to the second antenna via the second switch.

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3. The wireless communications device according to claim 1, further comprising:

a controller coupled to the transmitter module, the receiving module and switching module.

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4. The wireless communications device according to claim 3, wherein the transmission characteristic is determined for a particular transmission frequency employed by the transmitter module.

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5. The wireless communications device according to claim 3, wherein the transmission characteristic includes effects of a multipath environment .

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6. The wireless communications device according to claim 3, wherein the transmission characteristic includes at least one of signal strength, signal clarity and bit error rate.

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7. The wireless communications device according to claim 3, wherein the reception characteristic is determined for a particular reception frequency employed by the receiver module.
- 5 8. The wireless communications device according to claim 7, wherein the reception characteristic includes effects of a multipath environment.
9. The wireless communications device according to claim 7, wherein the reception characteristic includes at least one of signal strength, signal clarity and bit error rate.
10. The wireless communications device according to claim 1, wherein the controller includes a mobile station modem (MSM).
11. The wireless communications device according to claim 1, wherein the first antenna is not disposed in a same direction as the second antenna.
12. The wireless communications device according to claim 1, wherein the first antenna is disposed approximately orthogonally with respect to the second antenna.

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13. A system for providing a diversity antenna in a wireless communications device, comprising:

a first antenna;

5 a second antenna;

first means for selecting one of the first antenna or the second antenna for use in transmitting information as a function of transmission characteristics of the first antenna and the second antenna; and

10 second means for selecting one of the first antenna or the second antenna for use in receiving information as a function of receiving characteristics of the first antenna and the second antenna.

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14. The system according to claim 13, further comprising:

means for coupling a transmitter module to one of the first antenna or the second antenna as selected by the first selecting means; and

means for coupling a receiver module to one of the first antenna or the second antenna as selected by the second selecting means.

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15. A method for receiving and transmitting information in a particular multipath environment, comprising the steps of:

(a) selecting one of a first antenna or a second antenna for use in transmitting information as a function of transmission characteristics of the first antenna and the second

antenna in the particular multipath environment;

(b) selecting one of the first antenna or the second antenna for use in receiving information as a function of receiving characteristics of the first antenna and the second antenna in the particular multipath environment;

5 (c) coupling the information to be transmitted to one of the first antenna or to the second as selected in step (a); and

(d) coupling the information to be received to one of the first antenna or to the second antenna as selected in step (b).

10 16. A method for wireless communications, comprising the steps of:

(a) monitoring a reception characteristic of a first antenna of a wireless communications device that is coupled to a receiver module of the wireless communications device;

15 (b) evaluating the reception characteristic of a second antenna of the wireless communications device that is coupled to the receiver module; and

(c) coupling the receiver module to the second antenna instead of the first antenna.

20 17. The method according to claim 16, wherein the step of evaluating includes the step of evaluating only if the reception characteristic of the first antenna reaches a particular threshold value.

18. The method according to claim 16, wherein the step of evaluating includes the step of testing the second antenna by coupling the receiver module to the second antenna instead of the first antenna.

5 19. The method according to claim 16, wherein the step of coupling includes the step of coupling only if the reception characteristic of the second antenna is better than the reception characteristic of the first antenna.

10 20. The method according to claim 16, further comprising the steps of:
(d) evaluating a transmission characteristic of the first antenna and the second antenna; and
(e) coupling a transmitter module of the wireless communications device to one of the first antenna and the second antenna that has a transmission characteristic that more closely matches the reception characteristic of the second antenna.

15 21. A method for wireless communications, comprising the steps of:
(a) monitoring a transmission characteristic of a first antenna of a wireless communications device that is coupled to a transmitter module of the wireless communications device;
(b) evaluating the transmission characteristic of a second antenna of the wireless communications device that is coupled to the transmitter module; and
(c) coupling the transmitter module to the second antenna instead of the first antenna.

22. The method according to claim 21, wherein the step of evaluating includes the step of evaluating only if the transmission characteristic of the first antenna reaches a particular threshold value.

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23. The method according to claim 21, wherein the step of evaluating includes the step of testing the second antenna by coupling the transmitter module to the second antenna instead of the first antenna.

10 24. The method according to claim 21, wherein the step of coupling includes the step of coupling only if the transmission characteristic of the second antenna is better than the transmission characteristic of the first antenna.

15 25. The method according to claim 21, wherein the step of monitoring includes the step of receiving feedback information from a wireless communications network for use in determining the transmission characteristic.

26. A method for wireless communications, comprising the steps of:
(a) generating a list of base stations within range of a wireless communications device for a first antenna and a second antenna of the wireless communications device;
(b) monitoring a reception characteristic of the first antenna that is coupled to a receiver module of the wireless communications device;

- (c) if the monitored reception characteristic becomes poor, then testing reception characteristics between the first antenna and the base stations on the list and between the second antenna and the base stations on the list; and
- (d) if the tested reception characteristic of a particular antenna and a particular base station is better than the monitored reception characteristic, then coupling the receiver module to the particular antenna and coupling wirelessly the wireless communications device to the particular base station.

5 27. A method for wireless communications, comprising the steps of:

- 10 (a) generating a list of base stations within range of a wireless communications device for a first antenna and a second antenna of the wireless communications device;
- 15 (b) monitoring a transmission characteristic of the first antenna that is coupled to a transmitter module of the wireless communications device;
- (c) if the monitored transmission characteristic becomes poor, then testing transmission characteristics between the first antenna and at least one of the base stations on the list and between the second antenna and at least one of the base stations on the list; and
- 20 (d) if the tested reception characteristic of a particular antenna and a particular base station is better than the monitored transmission characteristic, then coupling the transmitter module to the particular antenna and coupling wirelessly the wireless communications device to the particular base station.